Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

Table of contents

Methods

Retrospective study of hospitalized patients

Patients admitted to the wards of departments of internal medicine, pediatrics or infectious diseases were sampled by nurses and physicians. We focus on three hospitals in central Wuhan, they are branches of Tongji Hospital of Tongji Medical College, Huazhong University of Science and Technology.

Throat swab specimens collected from hospitalized pediatric patients (≤16 years) admitted to any one of the three branches of our study hospital between January 7 and January 15, 2020 were retrospectively tested for SARS-CoV-2. All the three branches are located 14km to 34km from each other in central Wuhan (Figure S1).

Specimen Collection and Testing

One throat swab specimen was collected from each eligible patient after admission. Swabs were placed immediately in 3 mL viral transport media (VTM) and kept at 2-4℃ before being transported to the laboratory. Throat swab specimens collected in Branch B and Branch C were transported to and stored in the central laboratory in Branch A, and all specimens were stored at -80℃ until testing. Throat swab specimens were tested for viral etiologies with real-time reverse transcription polymerase chain reaction (RT-PCR) or real-time PCR assays. Total nucleic acid was extracted from 200μl of throat swab specimen, using fully automated Nucleic Acid Extraction System 9600E (Xi'an TianLong Science and Technology Co., Ltd., Xi'an, China). China Food and Drug Administration (CFDA) approved clinical diagnostic kits were used for the detection of influenza A virus (Shanghai ZJ Bio-Tech Co., Ltd.), influenza B virus (Shanghai ZJ Bio-Tech Co., Ltd.), herpes simplex virus 1 (Shanghai ZJ Bio-Tech Co., Ltd.), herpes simplex virus 2 (Shanghai ZJ Bio-Tech Co., Ltd.), enterovirus (DAAN Gene Co., Ltd), coxsackievirus A16 (DAAN Gene Co., Ltd), and enterovirus 71 (DAAN Gene Co., Ltd). The following primers and probes were used for real-time PCR detection of adenovirus: forward primer 5'-GCCACGGTGGGGGTTTCTAAACTT-3', reverse primer 5'-GCCCCAGTGGTCTTACATGCACATC-3', probe 5'-Cy5-TGCACCAGACCCGGGCTCAGGTACTCCGA-BQ2-3'.[1] The residual throat swab specimens and nucleic acid were stored at -80℃.

In response to the outbreak of COVID-19, we retrospectively tested the samples collected in the hospitalized pediatric patients for SARS-CoV-2. The following primers and probes were used for real-time RT-PCR detection of N gene of SARS-

CoV-2: N forward primer 5'-GAGCCTTGAATACACCAAAAG-3', N reverse primer 5'-GCACGATTGCAGCATTGTTAGCAGGATT-3', N probe 5'-FAM-CACATTGGCACCCGCAATCC-MGB-3'. The patients with specimen tested to be SARS-CoV-2 positive in two independent experiments of real-time RT-PCR assay. The positive cases were verified by CFDA approved clinical diagnostic kit (DAAN Gene Co., Ltd), and were confirmed as COVID-19 cases.

Data Collection and Analysis

Demographic, clinical, and laboratory data were collected with a standardized form from electronic medical records. We used descriptive statistics to summarize the etiological, demographic, and clinical characteristics of COVID-19 patients. Categorical variables were expressed as numbers and proportions.

Ethics

The study protocol was reviewed and approved by the ethics committee of Tongji Hospital of Tongji Medical College, Huazhong University of Science and Technology (TJ-C2030). Informed consent was obtained from parents or legal guardians of each child

Table S1. Lab-confirmed viral etiology of 366 hospitalized pediatric patients

Etiology	Number (%) of patients
Any viral etiology	79 (21.6)
Influenza A virus	23 (6.3)
Influenza B virus	20 (5.5)
Adenovirus	16 (4.4)
Enterovirus	15 (4.1)
SARS-CoV-2	6 (1.6)
Herpes simplex virus 1	3 (0.8)
Co-detection*	4 (1.1)

* Includes co-detection of influenza A virus and enterovirus (1 case), co-detection of herpes simplex virus 1 and adenovirus (1 case), and co-detection of influenza A virus and adenovirus (2 cases).

Table S2. Summary of clinical characteristics and clinical laboratory results of 6 pediatric COVID-19 patients.

Characteristics	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6
Days from symptom onset to hospitalisation	5	5	5	5	3	5
Symptoms and signs						
Fever	+	+	+	+	+	+
Cough	+	+	+	+	+	+
Swollen tonsils	+	+	+	+	+	+
Pharyngeal congestion	+	+	+	+	-	+
Vomiting	+	-	+	-	+	+
Wheeze	-	-	-	+	+	-
Tachypnea	+	-	-	-	-	-
Rhinorrhoea	-	-	+	-	-	-
Chill	-	-	+	-	-	-
Laboratory findings						
Haemoglobin (g/L); (normal range 110-147)	104 (↓)	120	113	118	115	120
White blood cell count (x10^9/L) [1]	2.96 (↓)	6.49	5.48	3.04 (↓)	3.95 (↓)	1.8 (↓)
Neutrophil count (x10^9/L); (normal range 1.50-8.50)	1.3 (↓)	3.15	2.54	0.66 (↓)	2.85	0.27 (↓)

|						
Lymphocyte count (x10^9/L) [2]	1 (↓)	1.19 (↓)	1.25 (↓)	1.7 (↓)	0.87 (↓)	0.36 (↓)
Platelet count (x10^9/L); (normal range 150.0-450.0)	203	272	256	191	153	165
Prothrombin time (s); (normal range 11.5-14.5)	NA	13.2	12.8	11.9	12.3	12.5
Activated partial thromboplastin time (s); (normal range 34.0-47.0)	NA	32.2	43.7	41	34	41.5
D-dimer (µg/mL); (normal range 0-0.5)	0.59 (↑)	0.22	0.78 (↑)	0.22	0.74 (↑)	0.38
Albumin (g/L); (normal range 38-54)	40	45.2	43.6	45.4	44.3	42.3
Bilirubin (µmol/L); (normal range 0-21)	NA	4	4.2	2.7	3.6	5.4
Alanine aminotransferase (U/L) [3]	6	14	11	23	43 (↑)	15
Aspartate aminotransferase (U/L) [3]	45 (↑)	30	42 (↑)	64 (↑)	36 (↑)	37
Creatinine (µmol/L); (normal range 45-84)	33 (↓)	34 (↓)	22 (↓)	29 (↓)	23 (↓)	30 (↓)
Creatine kinase (U/L); (normal range 0-170)	29	50	77	148	71	82
Lactate dehydrogenase (U/L) [4]	384 (↑)	197	476 (↑)	375	297	280
Sodium (mmol/L); (normal range 136-145)	NA	139.7	135.1 (↓)	137.5	133.8 (↓)	135.2 (↓)
Chlorine (mmol/L); (normal range 99-110)	NA	103.7	95.4 (↓)	100	99.4	99.5
Magnesium (mmol/L); (normal range 0.70-0.95)	1.04 (↑)	0.84	0.96 (↑)	0.93	0.86	0.86
Bicarbonate (mmol/L); (normal range 22.0-29.0)	21.9 (↓)	16.5 (↓)	17.6 (↓)	21.9 (↓)	16.5 (↓)	17.1 (↓)

| C-reactive protein (mg/L); (normal range 0-10) | 38.4 (↑) | 21 (↑) | 23.32 (↑) | 11.8 (↑) | 58.79 (↑) | 6.84 |
| Erythrocyte sedimentation rate (mm/h); (normal range 0-20) | 6 | NA | 21 (↑) | 7 | 25 (↑) | 8 |

Note: NA, not available; ↑, abnormal values higher than normal range; ↓, abnormal values lower than normal range. [1] Normal range of white blood cell count for children of different ages: 1-year-old child 5-15 x 10^9/L, 3 to 4-years-old child 4-12 x 10^9/L, 7-years-old child 3.4-10.8 x 10^9/L; [2] Normal range of lymphocyte count for children of different ages: 1-year-old child 4-13.5x 10^9/L, 3 to 4-years-old child 1.5-7 x 10^9/L, 7-years-old child 1.5-6.5 x 10^9/L. [3] Normal ranges of alanine aminotransferase and aspartate aminotransferase varied on different machines, for patients 1, 4, and 6, they were $\leqslant$ 41 and ≤ 40; for patients 2, 3, and 5, they were ≤ 33 and ≤ 32. [4] The normal range of lactate dehydrogenase is 120-300 for those $\geqslant$ 2 years old; for those < 2 years old, it is not provided by the manufacturer of the testing kit.

**Figure S1. Geographic location of our study hospital and 6 COVID-19 cases.**

Three branches of Tongji Hospital are located in the center of Wuhan City. Locations of 6 COVID-19 cases were plotted to a random point within the district or county. The patient 3 was admitted to local hospital in Yangxin, Huangshi on January 4, 2020 and referred to Branch A of Tongji Hospital on January 8, 2020.
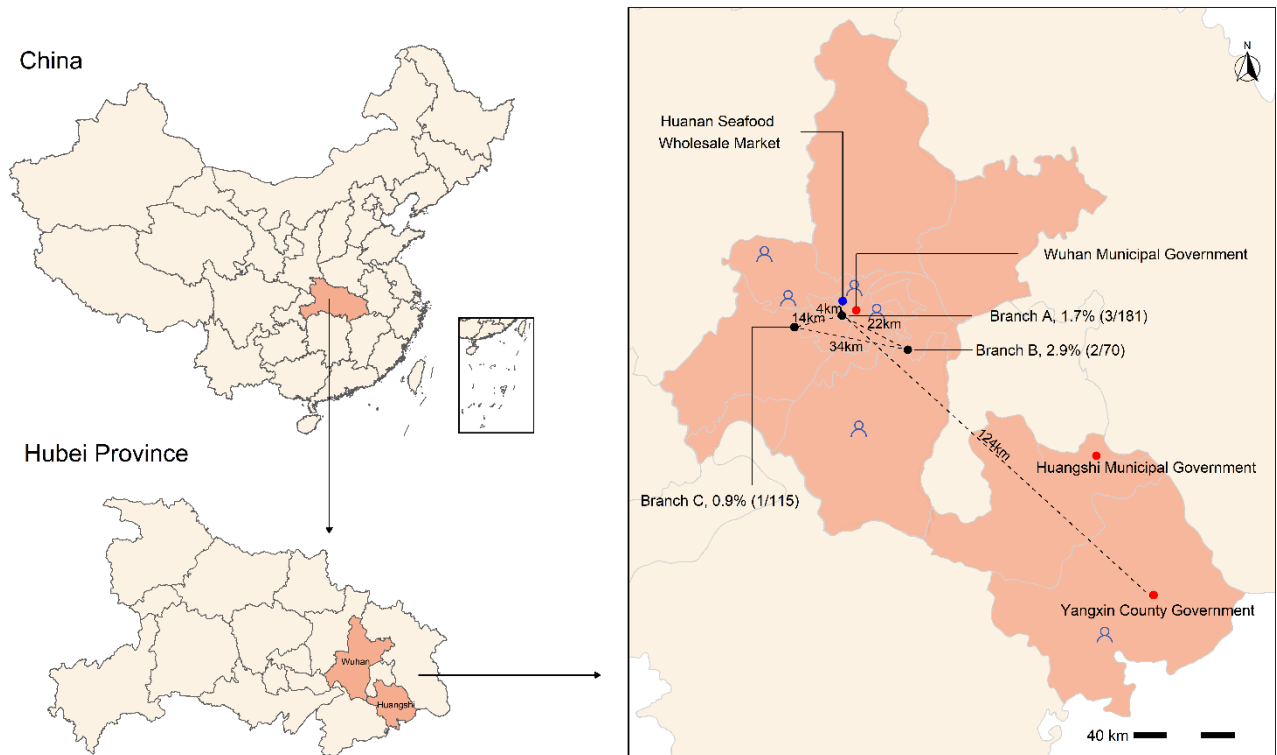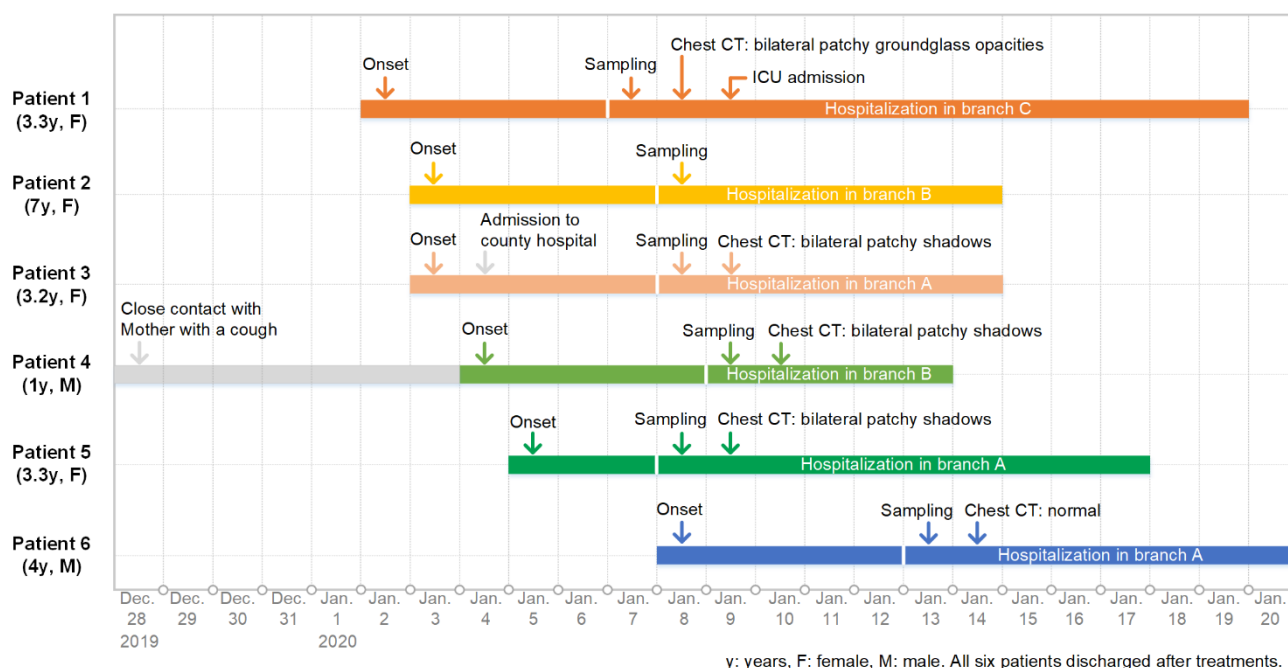
Figure S2. Temporal pattern of laboratory-confirmed pediatric COVID-19 patients and key events of the COVID-19 outbreak.

(A) Dates of hospital admission for six pediatric COVID-19 cases and key events of the COVID-19 outbreak. (B) Clinical course of six pediatric COVID-19 cases.
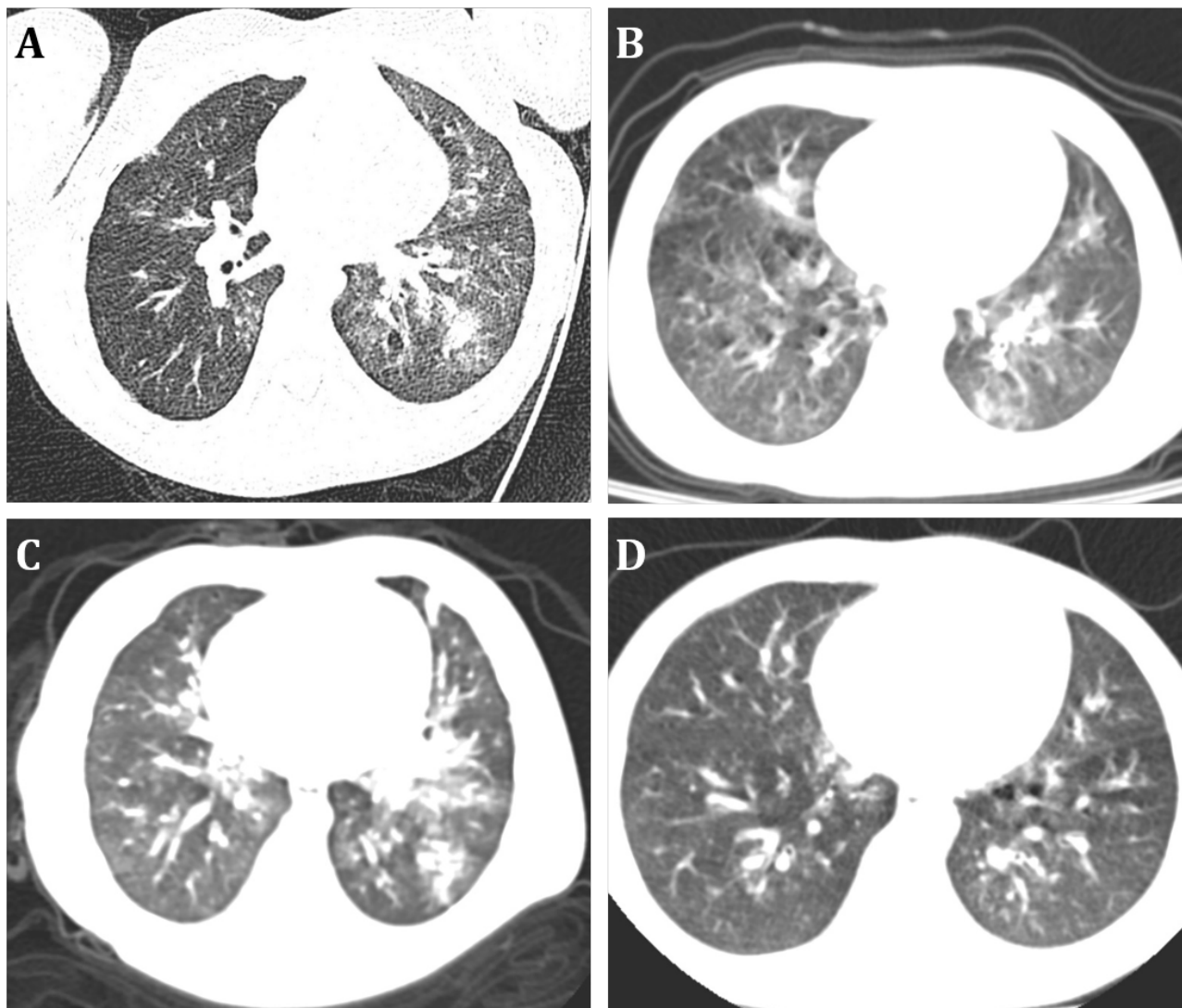
A.
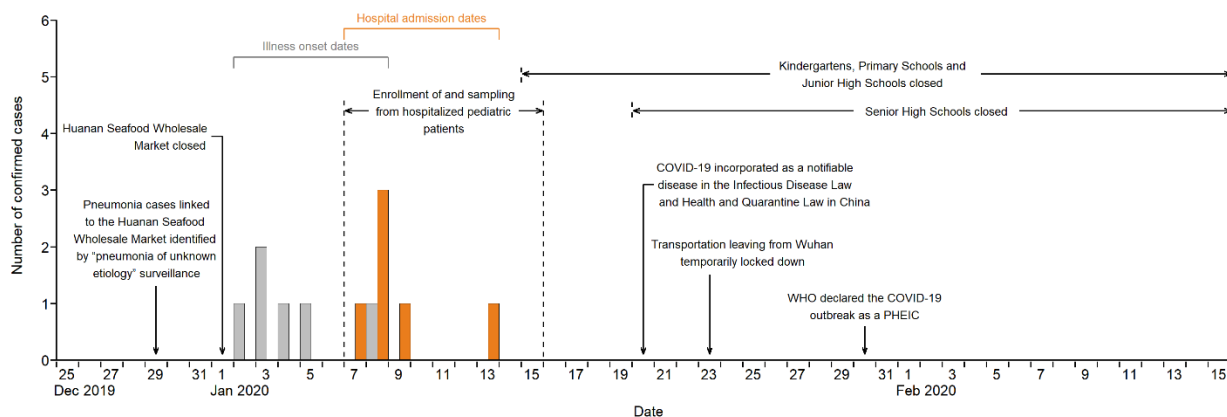
B.

y: years, F: female, M: male. All six patients discharged after treatments.

Figure S3. Chest CT scan images.
Representative thoracic CT scan images showing bilateral patchy ground glass opacities in the lung of patient 1 (A), and bilateral patchy shadows in the lungs of patient 3 (B), patient 4 (C), and patient 5 (D).

Author Contributions

YLiu, ZS, KL, WL, and QZ conceptualised the study design. SS, LC, and BZ recruited the patients, collected specimens, collected demographic, clinical, and laboratory data; WL, HS, and YLu did the laboratory tests. LL, and JZ plotted the figures; LX and LH interpreted the images of CT scans; WL, QZ, JC, LL, YY, FL, and LY analyzed the data; YLiu, and WL interpreted the results; WL, QZ, JC, RX, HY, and YLiu wrote the initial drafts of the manuscript; PW, MGS, and BJC commented on and revised the manuscript. All authors read and approved the final report.

Declaration of interests

H.Y. has received research funding from Sanofi Pasteur, GlaxoSmithKline, Yichang HEC Changjiang Pharmaceutical Company and Shanghai Roche Pharmaceutical Company. None of that research funding is related to COVID-19. BJC has received honoraria from Roche and Sanofi. All other authors report no competing interests. All authors have completed the Unified Competing Interest form.

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